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Mini Review

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The Economic Burden of PTSD. A brief review of salient literature

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Summary: Burden of Disease studies can help policy makers set priorities for health care spending and resource management. To date, there appears to be relatively few pieces of published research examining the economic cost of post-traumatic stress disorder (PTSD). The purpose of this review is to collate and synthesis contemporary research that looks at the economic burden of PTSD. PTSDpubs, the Cumulative Index of Nursing and Allied Health Literature (CINAHL), PubMed and Psych Info were used to identify studies reporting the economic cost of PTSD. Keywords used were “Cost of Illness” OR “Economic burden of disease” in PTSDpubs. “Cost of Illness”, “Burden of Disease” “PTSD” and “Psychological Trauma. Three studies were identified that reported the cost of PTSD. All of which report that the economic cost of PTSD is substantial. There are a number of limitations with these studies and further research from a societal perspective is required.

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The Economic Burden of PTSD. A brief review of salient literature.

Studies examine the economic burden of disease can be used to help policy makers set priorities for healthcare research and service provision [1]. These study types seek to quantify the economic impact of disease regardless of its origin or presentation. As such, policy makers are afforded the information allowing them to make decisions across and within therapeutic fields. Health economics deals with the scarcity of resources. Having accurate information about the economic cost of an illness helps policy makers prioritize, eventually leading to the allocation of healthcare resources [2].

Classified as an anxiety disorder, Post-Traumatic Stress Disorder (PTSD) is a condition that can have a significant negative impact on a person's life [3]. The symptoms of PTSD include flashbacks, intrusive thoughts and nightmares, rumination and avoidance of areas or circumstances (WHO 2017). Figure 1 shows the ICD-10 (WHO 1992) diagnostic criteria for PTSD. Psychological trauma is associated with a number of mental health issues including schizophrenia [4], eating disorders [5] and addictions [6]. In recent years a link between PTSD and physical illnesses such as Type II diabetes [7], cardio-vascular disease [8], certain cancers [9] and fibromyalgia [10] has been noted in the literature. General population studies estimated a prevalence rate of PTSD of 3.6% (WHO 2013). The lifetime prevalence of PTSD in

Vietnam War veterans was 16.9% [11] and a study of Canadian service veterans of the Iran war showed a prevalence of 12.9% [12]. UK service personnel returning from Iraq and Afghanistan report PTSD in 4% of cases [13]. In counties that have experienced civil conflict,

the rates of PTSD are reported as 8.8% [14]. Given the wide-ranging impact then of PTSD, it is appropriate to examine the economic impact that PTSD has.

F43.1 Post-traumatic Stress Disorder

Arises as a delayed or protracted response to a stressful event or situation (of either brief or long duration) of an exceptionally threatening or catastrophic nature, which is likely to cause pervasive distress in almost anyone. Predisposing factors, such as personality traits (e.g. compulsive, asthenic) or previous history of neurotic illness, may lower the threshold for the development of the syndrome or aggravate its course, but they are neither necessary nor sufficient to explain its occurrence. Typical features include episodes of repeated reliving of the trauma in intrusive memories ("flashbacks"), dreams or nightmares, occurring against the persisting background of a sense of "numbness" and emotional blunting, detachment from other people, unresponsiveness to surroundings, anhedonia, and avoidance of activities and situations reminiscent of the trauma. There is usually a state of autonomic hyperarousal with hypervigilance, an enhanced startle reaction, and insomnia. Anxiety and depression are commonly associated with the above symptoms and signs, and suicidal ideation is not infrequent. The onset follows the trauma with a latency period that may range from a few weeks to months. The course is fluctuating but recovery can be expected in the majority of cases. In a small proportion of cases the condition may follow a chronic course over many years, with eventual transition to an enduring personality change.

F43.1 Post-traumatic stress disorder

Diagnostic Criteria

- A. Exposure to a stressful event or situation (either short or long lasting) of exceptionally threatening or catastrophic nature, which is likely to cause pervasive distress in almost anyone.**
- B. Persistent remembering or "reliving" the stressor by intrusive flash backs, vivid memories, recurring dreams, or by experiencing distress when exposed to circumstances resembling or associated with the stressor.**
- C. Actual or preferred avoidance of circumstances resembling or associated with the stressor (not present before exposure to the stressor).**
- D. Either (1) or (2):**
 - (1) Inability to recall, either partially or completely, some important aspects of the period of exposure to the stressor
 - (2) Persistent symptoms of increased psychological sensitivity and arousal (not present before exposure to the stressor) shown by any two of the following:
 - a) difficulty in falling or staying asleep;
 - b) irritability or outbursts of anger;
 - c) difficulty in concentrating;
 - d) hyper-vigilance;
 - e) exaggerated startle response

Figure 1: ICD-10 criteria for PTSD (WHO 1992)

Aim

The aim of the current paper is to review the contemporary literature, which reports the economic burden of PTSD.

Search Strategy

A broad search was initially undertaken to identify relevant studies. PTSDpubs, the Cumulative Index of Nursing and Allied Health Literature (CINAHL), PubMed and Psych Info were used to identify studies reporting the economic cost of PTSD. Keywords used were “Cost of Illness” OR “Economic burden of disease” in PTSDpubs. “Cost of Illness”, “Burden of Disease” “PTSD” and “Psychological Trauma” were used in the other databases. The search took place on 21 May 2019. There was a paucity of primary research identified. A sum total of three studies are apparent that report the economic burden of PTSD [15,16,3]. These are discussed below.

Economic Burden of PTSD

McCrone et al [17] commented that, whilst economic evaluations of interventions for mental health problems had been undertaken none existed for PTSD. McCrone et al [17] also claim cost of illness studies had not been undertaken for PTSD. It would appear little has happened since. Ferry et al [15], in what they assert is the first cost-of illness study of PTSD globally, examined the economic impact of PTSD in Northern Ireland (NI). Ferry et al [15] adopted a prevalence based, bottom up approach (Thomas & Morris) [18] approach to calculating the total cost of PTSD in NI in 2008. Direct costs they included were the cost of medications and visits to service providers. Indirect costs collated were lost productivity due to absenteeism and presenteeism. They conducted a secondary analysis of data collected for the Northern Ireland Study of Health and Stress (NISHS) in 2008 and estimated a 12-month prevalence rate of PTSD in NI as 5.1% (approximately 75,000 adults). They estimate 318,815 individual contacts, based on the estimate of 75,000 service users,

with healthcare providers at an estimated cost of £27,317,184. Medication costs were estimated to be £5,658,406, of which £5 million was for anti-depressants, anxiolytics and anti-psychotics.

Ferry et al [15] report 2,283,130 days lost to work in 2008 as a result of PTSD. This accounted for 66% of all direct and indirect costs and is reported as £113,564,751. Presenteeism, the amount lost by sub-standard work [19], was estimated to cost £ 26,215,721 in 2008. It should be highlighted that Ferry et al [15] do not differentiate between statutory, private and voluntary providers in their calculations.

Fuchkan Buljan [16] reports, as part of a larger study, the social and economic cost of PTSD following the London Bombings in July 2005. She surveyed 230 clients attending NHS services in London having been affected by the bombings. Two hundred and five had been directly involved in the bombing and 179 witnessing a serious injury to others or a death. Fuchkan Buljan [16] adopted a bottom up approach using a health and social care perspective. Direct costs included health service usage (private, statutory and voluntary sectors) and medication costs. Indirect costs were costs due to sick leave, unemployment and reduced work hours. The productivity lost by sick leave, unemployment and hours reduced is reported as £777,596.26, £544,627.12 and £63,932.16 respectively. Direct service costs are summarized in Table 1. Fuchkan Buljan [16] does not appear to report a total number of days lost, rather she provides ranges of sick leave from 1 to 1112 days lost. She also reports that 29 people in her sample (total n=230) reduced their work hours and where people were made unemployed that period of unemployment ranged from 3 to 320 weeks.

In a brief report investigating the clinical and economic burden of PTSD in Vietnam War veterans, Wang et al [3] focused on the direct healthcare costs (in-patient, out-patient and pharmacy) associated with a diagnosis of

PTSD. Drawing their sample from the Veterans Health Association (VHA) database of veterans diagnosed with PTSD (n=492,546) they report that, on average, hospital in-patient costs incurred were \$5,486 per person. Mean

outpatient treatment costs are reported as \$10,057/ person and pharmacy costs as \$1.207 per person. The mean total cost incurred per person was \$16,750 [3].

Table 1: Direct Service Costs (£)

Screening & Assessment	Treatment	Health Services	Hospitalization	Medicines	Private Sector	Voluntary Sector
112,356.30	331,185.60	113,642.06	374,960.00	4296.23	51919.00	15004.84

The three studies above appear to represent the global sum total of studies examining the cost of PTSD. Table 2 summarizes the direct and indirect costs reported in the papers. The difference in perspectives used and methods of data collection make comparison and synthesis difficult. However, it is apparent that there is a

substantial economic cost associated with PTSD. This is particularly evident in the study by Wang et al [3], who include costs associated with common physical ailments associated with PTSD, such as hypertension.

Table 2: Direct and Indirect Cost of PTSD

Authors (Year)	Direct Costs included	Indirect Costs included	Total direct costs reported	Total indirect costs reported	Total cost of illness
Ferry et al (2015)	Service Use Medication	Productivity losses Presenteeism	£32,975,590	£139,780472	£172,756,062
Fuchkan Buljan (2015)	Service Use Medication	Costs of sick leave Unemployment Reduced work hours	£1,003,364.03	£1,386,156.22	£2,289,520.45
Wang et al (2016)	Service Use Medication	None	\$8,250,145,500		\$8,250,145,500*

*Wang et al (2016) report a mean cost of \$16750 per veteran. Total cost reported above calculated by multiplying by sample size n=492,546

Both Ferry et al [15] and Fuchkan Buljan [16] both report a high proportion of indirect costs as part of the total cost estimate for PTSD. However, they are both limited in what they include as an indirect cost. Goodman (2014) suggests that indirect costs can include lost or impaired leisure activity and other measurable but not directly related to healthcare costs. Curran et al [20] attempted to calculate the total impact of experiencing a traumatic event. Drawing from data collected from 2191 patients in NI they report that a number of social factors can have an impact on individual and subsequently on society. For example, Fuchkan Buljan [16] reports on the cost of being made unemployed, however Curran et al highlight

that having to change jobs as a result of the traumatic incident has almost the same impact on the individual. Given that Fuchkan Buljan [16] included being made unemployed as an indirect cost and extrapolated from an individual up to a healthcare perspective. It is reasonable to posit that, noting Curran et al's [20] findings, that she has underestimated the indirect costs of the London Bombings by not including a cost associated with changing jobs.

Similarly, Curran et al [20] found that being hospitalized in a mental health hospital had twice as much negative impact as admission to hospital for physical injuries after a traumatic event. None of the included studies appear to

differentiate between admission to hospital for physical issues related to the traumatic incident and admission to a psychiatric unit for a period of time.

McCrone et al [17] argue that the economic effects of PTSD impact the family, employer and wider society. Again, none of three studies examined the economic impact of PTSD on this wider circle leading to an underestimation of the true economic cost. Being forced to move house as a result of a traumatic event is again noted to impact on the psycho-social wellbeing of an individual (Curran et al) [20]. Whilst one can argue that the healthcare perspective adopted by Wang et al (2016) [3] and Fuchkan Buljan [15] would not take into account these factors, Rumbold et al [21], for example, note that house moves during early childhood can have a negative impact on a child's mental health.

Notwithstanding this lack of evidence, the economic cost of PTSD is substantial and potentially long lasting; Bunting et al [14] report that in NI, patients wait on average 22 years after the onset of disease before seeking professional help. Cognitive Behavioral Therapy (CBT) is recommended by the United Kingdom National Institute for Health and Care Excellence (NICE) as first line treatment for PTSD. In their recent guidance, NICE (2018) report five economic evaluations of interventions. Trauma-Focus CBT (TF-CBT) was dominant (more clinically effective at less cost (York Health Economics Consortium (2016) [22-24] than Prolonged Exposure, no treatment and Sertraline. Non trauma focused CBT resulted in lower costs but worse outcomes when compared to psychoeducation. Mihalopoulos et al adopted a cost utility approach to TF-CBT versus Treatment as Usual. They report an incremental cost-effective ratio of 19,000 AUD/ QALY gained. They conclude that TF-CBT is more cost effective than Treatment as Usual for people experiencing symptoms of PTSD. Ferry et al [15] estimate that it would cost £102million to treat all individuals included in their study with a course

of CBT.

Limitations

The small number of papers included in review make it difficult to make definitive conclusions about the overall economic burden of PTSD. Whilst a broad-brush approach to identifying literature used, it did not include searches for grey literature, nor were papers included that examined the economic burden of anxiety disorders. As such some reports of the economic burden of PTSD may be missing from this review.

Conclusion

In addition to the personal cost of PTSD, the economic impact of PTSD is substantial. In healthcare systems where resources are scarce it is important to properly quantify the impact of not only healthcare interventions but also the underlying cost of the illnesses. The papers reviewed show a substantial economic cost to healthcare systems and to society as a whole. However, it is likely given the small number of studies, the limitations inherent in the studies above and the narrow parameters adopted in each of them that the economic cost of PTSD is being underestimated. A wide-ranging, societal perspective examination of the cost of PTSD is required. Additionally, cost effectiveness studies of clinically effective interventions for PTSD, should be undertaken.

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